

REMARKS:

CLAIM AMENDMENTS AND ARGUMENTS FOR PATENTABILITY:

REJECTIONS UNDER 35 U.S.C. § 102:

Claim 10 has been amended to contain the limitations of claim 14. Claim 14 has been canceled.

In the Action, it is argued that claims 10-13 and 15-20 are anticipated by Larsson ('538) under 35 U.S.C. § 102(b).

Initially, it is important to be cognizant of the long-standing standard that anticipation under §102 can only be found if a reference shows exactly what is claimed. The identical invention must be shown in as complete detail as is contained in the patent claim. Furthermore, the elements must be arranged as in the claim under review.

This rejection is not proper because Larsson ('538) does not recite all the claim limitations as set forth in claim 10. One example of a limitation not disclosed by Larsson ('538) is that "interacting tooth faces of the planetary gear arrangement being angled in such a manner in relation to the longitudinal axis of the input shaft and the output shaft that an axial force arises on the ring gear from gear speed changes during synchronizing, and this force, at least on shifting to a low range position, tends to move the ring gear in the same direction as an external shifting force."

Since this limitation is not found in Larsson ('538), there is no basis for rejection of claim 10 under 102(b). Because the independent claim 10 is not anticipated by Larsson ('538), the dependent claims 12, 13, and 15-20 cannot be anticipated by Larsson ('538) either.

REJECTIONS UNDER 35 U.S.C. § 103:

In the Action, it is argued that claims 1-9, 14 and 21 are obvious based on a combination of Larsson ('538) in view of Frost ('370) under 35 U.S.C. § 103. Further, the Action acknowledges that an important and recited feature of the present invention relates to the helical configuration of the inter-engaging gear teeth which generates a shift-assisting force in the sun-planet-ring gear configuration.

In order to establish a *prima facie* case of obviousness the initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. Three criteria are required to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). MPEP § 2142. The Action fails to establish all three elements through the use of Larsson ('538) in view of Frost ('370). Applicant believes the following correctly argues both Larsson ('538) and Frost ('370) as required in an obviousness type rejection.

Several important obviousness standards are presented in order to understand the argument that follows. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. MPEP § 2143. A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. MPEP § 2143.01 IV.

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. MPEP § 2143.01 V.

As will be explained below, there is no motivation to modify or combine Larsson ('538) in view of Frost ('370). Also, there is no indication of reasonable expectation of success. Even if properly combined, the combination of Larsson ('538) and Frost ('370) does not teach all claim limitations.

Fig. 1 of Frost ('370) {provided below}, clearly shows that not only is a ring gear not included, but further, utilization of the Frost ('370) arrangement with a ring gear would prevent proper functioning. Still further, incorporation of the Frost ('370) arrangement into that of Larsson ('538) would similarly prevent Larsson ('538) from functioning. Also, Frost ('370) states that "during either reverse or forward drive, the sleeve 38 cannot be shifted until the input force is relieved." The Action stated that "[t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference." This statement follows that of MPEP 2145 III, but the MPEP further states that the test is what the combined teachings of those references would have suggested to those of ordinary skill in the art. There is clearly no disclosure, teaching, or suggestion supporting a combination of Larsson ('538), in view of Frost ('370), as asserted in the Action.

In the present Action, Applicant again notes that regarding Larsson ('538), the concluding observation is that "the teeth are not angled to provide axial force to assist shifting between the first and second positions." Therefore, that leaves Frost ('370) to provide such disclosure.

The Action acknowledges that Larsson ('538) does not disclose the angled teeth. It then proposes to say that the teaching of "having a range gearbox using an axially shiftable ring gear is suggested and in combination with the teaching of Frost disclosing using angled teeth to assist in movement of a sun gear being suggested." The present invention cannot be imagined and produced by just these teachings alone. In Frost ('370), it is stated that the shifting does not take place until the force is relieved. Larsson ('538) discloses a range gear that is designed to shift while the vehicle is in motion. Thus it would not be obvious for one of ordinary skill in the art to combine a shifting mechanism that requires the input shaft to be of a relatively low speed with

one of high speed. Further, Frost ('370) requires going through a neutral state to shift the gears as disclosed. There is no shifting to neutral present in Larsson ('538). Thus, it is hard to see why one of ordinary skill in the art would combine Frost ('370) and Larsson ('538).

Relevant portions of Frost ('370) are provided below; namely: column 1, lines 18-21, 31-44; column 2, lines 61-73; and column 3, lines 1-30 as well as Fig. 1.

3,009,370
REVERSING MECHANISM
Barry L. Frost, Jackson, Mich., assignor to Clark Equipment Company, a corporation of Michigan
Filed Aug. 23, 1960, Ser. No. 51,373
5 Claims. (Cl. 74-784)

Lines 18-21:

Another object of my invention is to provide a reversing mechanism in which the friction engaging devices are held in engagement by the axial thrust of the associated helical gears.

Lines 31-44:

The outer sun gear is slidable axially from a neutral position either fore or aft which causes engagement of the forward clutch or reverse brake respectively. The forward clutch connects the outer and inner sun gears together so that they rotate as a unit locking up the planetary gear set, thus causing the planet carrier to rotate in the same direction and at the same speed as both sun gears, while the reverse brake causes the outer sun gear to be held so the planet carrier rotates in the opposite direction to the inner sun gear.

In either forward or reverse drive, the axial thrust between the outer sun gear and the small diameter portion of the planet pinions holds the respective clutch or brake in engagement.

Lines 61-73:

I shall now describe the operation of my invention. Assume that the input shaft 24 is turning in a clockwise direction when viewed from the left in FIG. 1 and further assume that the shift fork 68 is moved to the right from its neutral position. Movement of the shift fork 68 to the right will cause sleeve 38 to move to the right also and thereby cause initial engagement of the disc brake 58. Initial engagement of disc brake 58 causes the sleeve 38 to be locked to the end plate 12 thus holding the outer sun gear 44. This causes the planetary pinions 46 and planet carrier 54 to revolve around the outer sun gear 44 in a counterclockwise direction, thus giving reverse drive from the output shaft 20.

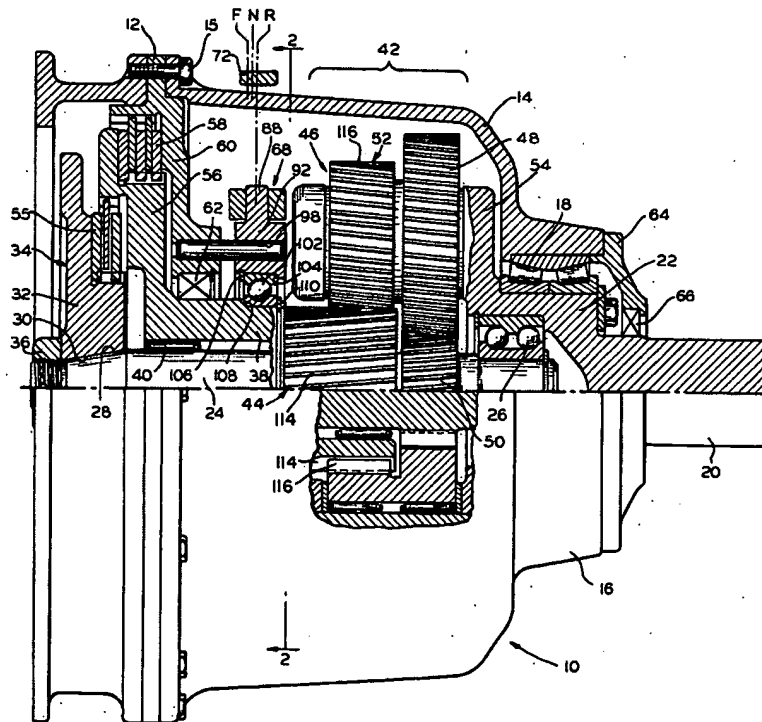
During reverse drive, the sun gear 44 acts as a reaction member and has a force applied to it by the small diameter portion 52 of the planet pinions 46. This force has an axial component which urges the sun gear 44 to the right due to the left-hand helical teeth 114 of the sun gear and the right-hand helical teeth 116 of the small diameter portion 52 of the pinions 46. This axial force tends to keep the disc brake 58 engaged after initial engagement and increases proportionately with the input force.

Assuming now that the shift fork 68 is actuated to the left from its neutral position, the sleeve 38 is thereby moved to the left thus initially engaging the disc clutch 55. Engagement of the disc clutch 55 locks the sleeve 38 to the flange 34 so that the outer sun gear 44 and the inner sun gear 50 rotate together. This locks up the planetary set 42 so that the output shaft 20 rotates with the input shaft 24 thereby giving forward drive.

During forward drive, the sun gear 44 acts as a driving member and applies a force to the small diameter portion 52 of the pinions 46. This force has an axial component due to the left-hand helical teeth 114 of the sun gear 44 and the right-hand helical teeth 116 of the small diameter portion 52 of the pinions 46. This axial component has an opposite reaction force which urges the sun gear 44 to the left thereby tending to keep the disc clutch 55 engaged after initial engagement and increases proportionately with the input force.

During either reverse or forward drive, the sleeve 38 cannot be shifted until the input force is relieved.

Fig. 1:



From these excerpts, it may be appreciated that the teeth of the Frost ('370) reference are angled in such a way as to lock the forward and reverse gears in their respective positions as long as there is a driving force on the input shaft.

It is also noted that the Action continues to mistakenly interprets the sun wheel (44, 50) of Frost ('370) as having a rotation in the clockwise direction via the input shaft (24) with teeth being directed to the right. This observation is directly counter to the express disclosure in Frost ('370) at column 3, lines 5-7 where "the left-hand helical teeth 114 of the sun gear and the right-hand helical teeth 116 of the small diameter portion 52 of the pinions 46" are described {also see Fig. 1 of Frost ('370)}.

The importance of this misinterpretation of Frost ('370) by the Action is that in the present application (please see paragraph [0015]), it is explained that Applicant's sun wheel rotates in the clockwise direction (similar to Frost ('370)) and has teeth directed to the right; i.e., to the opposite direction compared to Frost ('370). The reason for this is that with respect to the present invention, the recited configuration augments shifting force, especially when shifting from a high to low range. In the presently disclosed arrangement, the ring gear moves to the right with respect to Fig. 1, and the planetary gears tend to move in the opposite direction, but because they have no where to go, the ring gear moves. The corresponding situation in the Frost ('370) reference is not possible because the ring gear is missing and the teeth are not similarly angled. Among other reasons, Frost ('370) is designed to lock the forward and reverse gears in their respective positions as long as there is a driving force on the input shaft. Thus, there is no teaching concerning the Applicant's chosen arrangement of gears and the direction of the teeth on the gear.

Further, when shifting from high to low range according to the present invention, the input and output shafts are rotating in the same direction. This means that the input and output shafts rotate during gear shift (i.e.; shifting between two forward gears). The vehicle is typically moving during these kinds of gear shifts. Further, if the vehicle is not moving, the gears and shafts stand still, and the forces addressed in the present invention will not arise. Consequently, the Applicant's invention has effect when the vehicle is moving.

The Frost ('370) arrangement, on the other hand, is designed for shifting between forward and reverse gears. In principle, this means that the vehicle is standing still during a Frost ('370) gear shift, and the input and output shafts do not rotate during a forward/reverse gear shift in order to avoid the inducement of excessive stress on the construction. From this it may be accepted that since the shafts of Frost ('370) do not rotate during such a gearshift, no force is generated to augment the shifting force, especially in an axial direction, as recited in Applicant's claims. It is stated in Frost ('370) that "the sleeve 38 cannot be shifted until the input force is relieved."

Thus, the difference in rotation of the gears and output shafts does not allow for an obviousness rejection. Forward and reverse gears are different because of the direction of motion of the vehicle and the forces required allowing for the shifting of the gears. There is no motivation to combine the references on this ground either. Additionally, the gears in Frost ('370) change the direction of motion of the output shaft. Larsson ('538) features gears that change the relative speeds of the input and output shafts of the range gearbox. The difference between these two modes of operation is important when considering the shifting mechanism to be used. Thus the teaching concerning the shifting of the gears cannot be found through a combination of Larsson ('538) and Frost ('370).

It could also be said that Frost ('370) even teaches away from combining because it explicitly states "[d]uring either reverse or forward drive, the sleeve 38 **cannot** be shifted until the input force is relieved." Since this never occurs during a typical shift of Larsson ('538), one of ordinary skill in the art would not be compelled to combine the references.

Thus the prima facie elements of an obviousness rejection under 35 U.S.C. § 103 have not been set forth in the Action. Applicant respectfully requests that the obviousness rejection be withdrawn and the claims allowed to issue.

Serial No.: 10/065,691
Confirmation No.: 2337
Applicant: ALFREDSSON, Sverker
Atty. Ref.: 07589.0060.PCUS00

GENERAL REMARKS:

The undersigned representative requests any extension of time that may be deemed necessary to further the prosecution of this application.

Further, the undersigned representative authorizes the Commissioner to charge any additional fees under 37 C.F.R. 1.16 or 1.17 that may be required, or credit any overpayment, to Deposit Account No. 14-1437, referencing Order No. 07589.0060.PCUS00.

In order to facilitate the resolution of any issues or questions presented by this paper, Examiner is requested to directly contact the undersigned by phone to further the discussion.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Tracy Druce", written in a cursive style.

Tracy Druce
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